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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/391,473	09/08/1999	NOBORU KUBO	4930(840)	8652

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EXAMINER

WHIPKEY, JASON T

ART UNIT	PAPER NUMBER
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2612

DATE MAILED: 07/16/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/391,473

Applicant(s)

KUBO ET AL.

Examiner

Jason T. Whipkey

Art Unit

2612

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☒ Claim(s) 11-17 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 September 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

- ✓1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because Figure 4 includes the reference sign "117" not mentioned in the description. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign in the description is required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
- ✓2. Figure 6 should be designated by a legend such as --Prior Art-- or --Related Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Temes (U.S. Patent No. 4,602,291).

Regarding claims 1-3, Temes discloses a pixel non-uniformity correction system, as shown in Figure 1. The system includes a memory comprised of offset memory 14 and gain memory 28, which store image signals in response to illumination directed to imager array 10 at light levels X1 and X2, which are detected by imager 10 at levels Y1 and Y2 (column 2, lines 15-19). Arithmetic unit 18 forms a calculation section for determining constants M and B in the equation $Y = MX + B$, where M is a gain coefficient and B is an offset level (column 2, lines 4-14).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 4, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Temes in view of Suganuma (U.S. Patent No. 6,034,794).

Regarding claim 4, Temes discloses a pixel non-uniformity correction system, as shown in Figure 1. The system includes a memory comprised of offset memory 14 and gain memory 28, which store image signals in response to illumination directed to imager array 10 at light levels X1 and X2, which are detected by imager 10 at levels Y1 and Y2 (column 2, lines 15-19). Arithmetic unit 18 forms a calculation section for determining constants M and B in the equation $Y = MX + B$, where M is a gain coefficient and B is an offset level (column 2, lines 4-14).

Temes is silent with regard to comparing M and B with predetermined coefficients to determine the presence or absence of a pixel defect.

Suganuma discloses an image sensor signal correction device, as shown in Figure 3. Defective pixel corrector 133 determines whether a particular pixel is defective by comparing a value that is calculated when image sensor 1 is exposed to white light with a predetermined threshold ("predetermined reference photoelectric coefficient a_0 ") (column 7, lines 19-27). Similarly, defective pixel corrector 133 determines whether a particular pixel is defective by comparing a calculated offset with a predetermined threshold ("predetermined reference offset output level b_0 ") (column 12, lines 49-57).

An advantage to differentiating between defective and non-defective pixels is that they may be corrected accordingly — e.g., non-defective pixels could be corrected with a calculated gain and offset, while defective pixels can be corrected by interpolation. For this reason, it would have been obvious at the time of invention to have Temes determine whether each pixel output is defective or satisfactory.

Regarding claim 8, Temes teaches that the amount of light incident upon the imager array 10 is either none (column 6, lines 11-14) or at a "predetermined level" (column 6, lines 15-24). However, Temes is silent with regard to using a level of light that places imager array 10 in a near-overflow state.

Since Temes does not specify the "predetermined level", it would have been obvious at the time of invention to use any light level, such as one that places the imager array in a near-overflow state, especially because the measurement of incident light with a large variation in brightness would produce a more accurate result.

Regarding claim 9, Temes teaches that the amount of incident light may be determined by using the equation $X = [(Y-B)/M]$ (column 2, line 27).

9. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Temes in view of Contini (U.S. Patent No. 6,184,529).

Claim 5 may be treated like claim 1. However, Temes is silent with regard to using a defocused optical system for calibration.

Contini discloses a uniformity correction apparatus for an imaging system. As stated in column 2, lines 42-48, an advantage to using a defocused optical device when calibrating an imaging device is that a uniform photon flux may be cast upon the imaging device without needing a perfectly uniform illumination device. For this reason, it would have been obvious at the time of invention to have Temes include a defocused optical system, such as the one described by Contini.

10. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Temes in view of Suganuma and further in view of Contini.

Claim 5 may be treated like claim 4. However, Temes is silent with regard to using a defocused optical system for calibration.

Contini discloses a uniformity correction apparatus for an imaging system. As stated in column 2, lines 42-48, an advantage to using a defocused optical device when calibrating an imaging device is that a uniform photon flux may be cast upon the imaging device without needing a perfectly uniform illumination device. For this reason,

it would have been obvious at the time of invention to have Temes include a defocused optical system, such as the one described by Contini.

11. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Temes.

Claim 7 may be treated like claim 1. Additionally, Temes teaches that the amount of light incident upon the imager array 10 is either none (column 6, lines 11-14) or at a "predetermined level" (column 6, lines 15-24). However, Temes is silent with regard to using a level of light that places imager array 10 in a near-overflow state.

Since Temes does not specify the "predetermined level", it would have been obvious at the time of invention to use any light level, such as one that places the imager array in a near-overflow state, especially because the measurement of incident light with a large variation in brightness would produce a more accurate result.

12. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Temes in view of Suganuma and further in view of Fossum (U.S. Patent No. 5,995,163).

Claim 10 may be treated like claim 9. However, Temes is silent with regard to performing offset and gain calculations using a median value of pixels neighboring a subject pixel.

Fossum discloses a median filter for an imaging system. As stated in column 1, lines 12-21, median filtering is a well-known image processing tool that replaces a pixel with the median value of a neighborhood of pixels. As stated, an advantage to

performing median filtering is that noise may be reduced. For this reason, it would have been obvious at the time of invention to have Temes perform median filtering.

Allowable Subject Matter

13. Claims 11-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 11, no prior art could be located that teaches or fairly suggests an image sensor calibration system that find a median among outputs from a plurality of pixels in a neighborhood that have the same color.

Regarding claims 12 and 13, no prior art could be located that teaches or fairly suggests an image sensor calibration system that detects defective pixels using the given equations.

Each of claims 14-17 are dependent on claim 12 or claim 13.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason T. Whipkey, whose telephone number is (703) 305-1819. The examiner can normally be reached Monday through Friday from 9 A.M. to 6:30 P.M. eastern daylight time, alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy R. Garber, can be reached on (703) 305-4929. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communication and (703) 872-9315 for After Final communication.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office, whose telephone number is (703) 306-0377.


Response to this action should be mailed to:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

or faxed to the appropriate number above for communications intended for entry. (For informal or draft communications, please label "**PROPOSED**" or "**DRAFT**".)

Hand-delivered responses should be brought to the sixth floor receptionist of Crystal Park II, 2121 Crystal Drive in Arlington, Virginia.

JTW
JTW
July 9, 2003


WENDY R. GARBER
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